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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/631,848	08/01/2003	Ju-Seon Goo	9862-000014/US	1042
30593	7590	11/29/2005	EXAMINER	
HARNESS, DICKEY & PIERCE, P.L.C.			EVERHART, CARIDAD	
P.O. BOX 8910			ART UNIT	PAPER NUMBER
RESTON, VA 20195			2891	

DATE MAILED: 11/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/631,848

Applicant(s)

GOO ET AL.

Examiner

Caridad M. Everhart

Art Unit

2891

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-51 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 34-35 is/are allowed.
- 6) ☒ Claim(s) 1-4, 10-14, 21-27, 29, 36-39, 41-46, 48-51 are rejected.
- 7) ☒ Claim(s) 3, 4, 8 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Applicant's arguments with respect to claims 1-4,7,10-16,21-27,29,30,36-39,41-46,48-51 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Shimizu, et al. (US 5,922,411).

Shimizu et al discloses the steps of spinning polysilazanes on a semiconductor substrate(col. 14, lines 5-10 discloses that the substrate is semiconductor; col. 17, lines 57-62 discloses the film was applied by spinning). An aqueous solution of oxidant such as acid or peroxide is applied (col. 2, lines 33-40 and 60-65). There is a heating step below 400 degrees C for drying (col. 38, lines 33-43). The exposure to the oxidant is in a bath(col. 38, lines 39-42) which is a dipping. The exposure may be by vapor and the vapor may be steam (col. 2,lines 40-44).

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 2-4,7,10-16,21-27,29,30,36-39,41-46,48-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu, et al. (US 5,922,411) in view of Shibuya, et al. (US 5,614,271).

Shimizu et al is silent with respect to a semiconductor substrate and with respect to the recited concentrations nor the recited structures and the recited times for the bake.

Shibuya, et al disclose a silicon wafer (abstract). Polysilazane is coated on the wafer(col. 3, lines 46-50 and 63-67)) and oxidized using ozone.

Shibuya, et al teaches forming a spin on coating of polysilazane dissolved in a solvent such as toluene(col. 4, lines 15-20 and 27-30 discloses a solution) on a semiconductor substrate(abstract and col. 4, lines 28-32). The layer is then treated with ozone in order to convert the layer to oxide(col. 4, lines 50-64). The layer is first heated to a temperature below 400 degrees C(col. 4, lines 35-40) before the oxidation step. There is a hard bake at a temperature range which includes the recited temperature(col. 4, lines 65-68), so that the results recited with respect to etch resistance would be expected to be present. Shibuya, et al further discloses that the substrate can include circuit wiring of metal such as aluminum and in a circuit the metal would have been in a pattern as circuit wiring is in a pattern(col. 3, lines 49-55). Shibuya, et al further teaches oxygen and water vapor as the oxidant(col. 6, lines 42-46).

It would have been obvious to one of ordinary skill in the art at the time of the invention that the method disclosed by Shimizu et al could be combined with the semiconductor structures taught by Shibuya, et al because Shibuya, et al teach that the oxidized polysilazane is a useful dielectric layer in semiconductor circuit structures.

With respect to the recited metals, these are conventional in the art as contact structures with aluminum metallization, which is taught by Shibuya et al, and as substitutes for aluminum metallization, so that it would have been obvious to one of ordinary skill in the art at the time of the invention to have used the recited materials.

With respect to the proportions of the solvents recited and the bake times, these are

Art Unit: 2891

variables of the art which one of ordinary skill in the art would have been able to determine .

Allowable Subject Matter

Claims 34-35 allowed.

Claims 5,6,8,9,17-20,28,31-33,,35,40,47 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Caridad M. Everhart whose telephone number is 571-272-1892. The examiner can normally be reached on Monday through Fridays 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, B. Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CME
11-23-05

C. Everhart
CARIDAD EVERHART
PRIMARY EXAMINER